DOCUMENT RESUME

ED 228 879 FL 013 668

TITLE	Mathematics: A Practical View. Volume I, Teacher Edition. Applied Basic Curriculum Series.
INSTITUTION	Evaluation, Dissemination and Assessment Center, Dallas.
SPONS AGENCY	Office of Bilingual Education and Minority Languages Affairs (ED), Washington, DC.
PUB DATE	82
NOTE	133p.; The teacher edition incorporates the same material as issued in a separately available student edition; For related documents, see FL 013 669-673.
AVAILABLE FROM	Evaluation, Dissemination and Assessment Center, Dallas Independent School District, Dallas, TX 75204 ($3.00; student edition $2.75).
PUB TYPE	Guides - Classroom Use - Guides (For Teachers) (052)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	Cultural Context; Educational Games; Intermediate Grades; Learning Activities; *Mathematics Materials; Supplementary Reading Materials; Teaching Guides; Textbooks

ABSTRACT

The activities in this volume of practical mathematics are intended for the intermediate grades. The manual contains three components which can be structured in different combinations according to different student needs. Built around a review of selected objectives in the mathematics basic curriculum, the material is intended to stimulate interest in both mathematics and the professional world. The first section of each component revolves around challenging and fun problems; the second section deals with practical aspects of math in everyday life; and the third component presents math problems similar to those students will encounter in contemporary life. The activities contain narratives, puzzles, games, and other activities of high interest and low readability. Each section is introduced by a statement of learning objectives, the cognitive and affective domains and levels concerned, materials, key words, and guidelines for implementation. Each section also contains an exercise that is applied to home and community, such as computing the price of an article that is being sold at a discount. The activities include exercises and evaluations based on the mathematical skill reviewed. The skills and life situations dealt with in this volume are public services; square roots; using fractions in marketing and distribution; and decimals, fractions, and percentages in connection with business and office jobs. (AMH)

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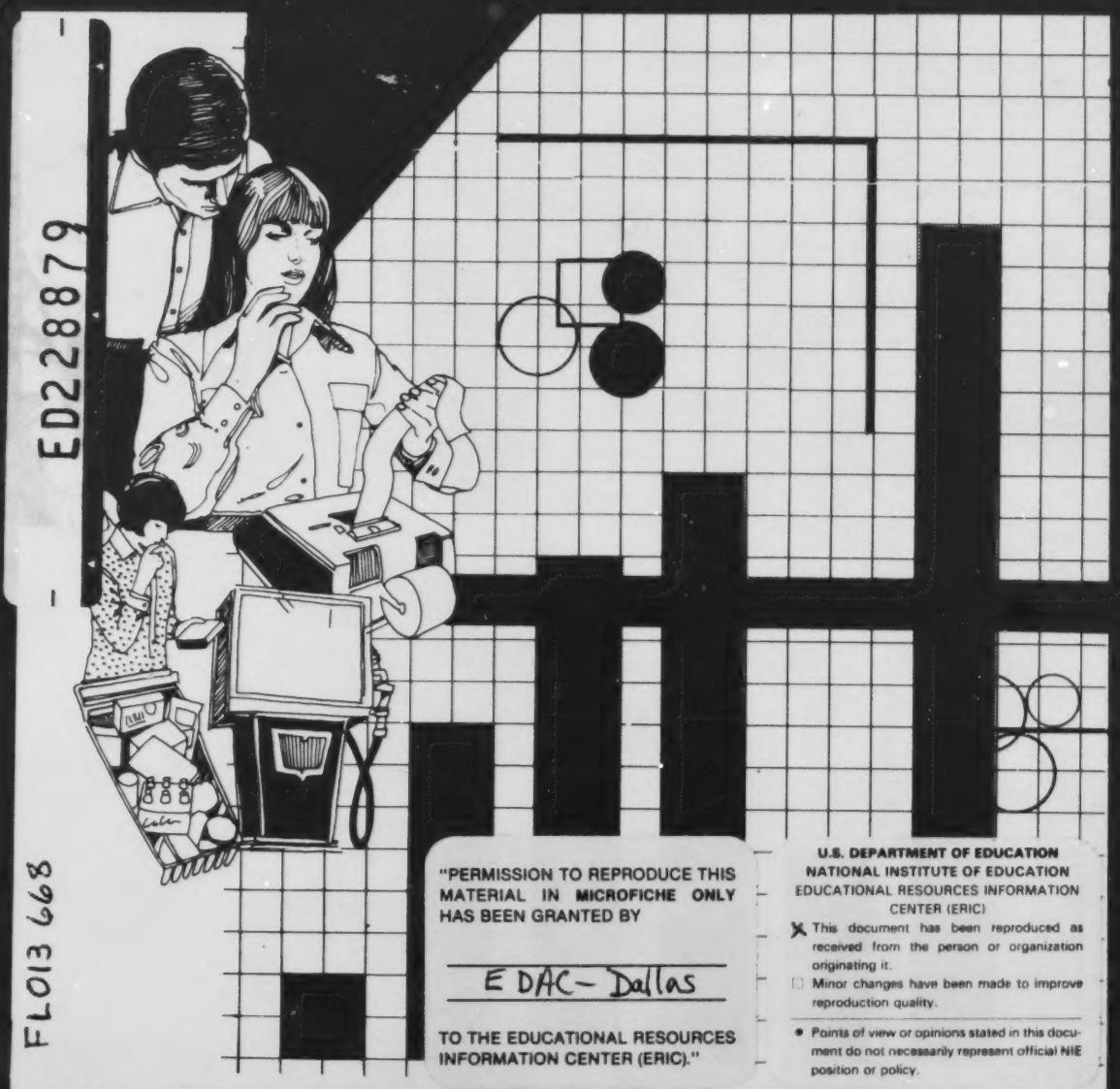
APPLIED BASIC CURRICULUM SERIES

Mathematics:

a practical view

Teacher Edition

Volume 1



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This publication was printed with funds provided by Title VII of the Elementary and Secondary Education Act of 1965, as amended by Public Law 95-561.

Published by
Evaluation, Dissemination and Assessment Center—Dallas
Dallas Independent School District
Dallas, Texas 75204
(214) 742-5991

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INSTRUCTIONAL APPROACH

The activities in Mathematics: A Practical View are intended for the intermediate grades. Each of the three volumes of the series has three components which can be structured in different combinations. In this way, the teacher may choose and use those which best meet students' individual needs. Built around a review of selected objectives in the mathematics basic curriculum, the material stimulates interest in math as well as in the professional world. The first section of the component is designed to motivate students with challenging and fun problems. The second is closely related to objectives dealing with practical aspects of math in everyday life. The third component affords students valuable experience in solving math problems similar to those encountered in the real world. The order in which the three components are presented does not indicate sequence or level of difficulty. The activities contain narratives, puzzles, games, and fun activities which are of high interest and low readability. A detailed procedure section and a Home and Community activity are included in each section. Each activity includes exercises and evaluations based on the math skill reviewed. It is hoped that teachers will find these supplementary materials interesting, innovative, and motivational.

Component 1

Section One

Section Two

Section Three

PUBLIC SERVICES

Introduction

This component is designed to show how jobs in the Public Service Cluster might require the ability to solve math problems involving whole numbers. In the first section, students will find the square root of perfect whole numbers, relating this to the math teacher's job. The second section is dependent on the understanding that wages are what someone is paid for his or her time and effort. The students will determine gross and net pay, relating this to the job of the city manager and to several other jobs in Public Service. In the third section, students will solve stated problems involving whole numbers, relating these problems to the detective's job in Public Service.

GOALS

MOTIVATION: The students will determine the square root of perfect whole numbers.

LIFE SKILLS: The students will determine gross and net pay for a given amount of time and a given rate of pay.

MATH SKILLS: The students will use basic operations to solve stated problems involving whole numbers.

LEARNING SECTIONS

SECTION 1: The Answer to the Puzzle

SECTION 2: Managing the City Budget

SECTION 3: Looking for Clues

COMPONENT I

Section One

Section One
The Answer to the Puzzle

Learning Objective

Given the divide-and-average method of finding the square root, the students will find the square root of six perfect square whole numbers with at least 80% accuracy.

Key Words

- square root
- square
- divide-and-average
- divisor
- quotient
- Public Service

Domains and Levels

Cognitive: Knowledge, Application, Analysis

Affective: Receiving, Valuing

Materials

one copy of the narrative for each student.

IMPLEMENTATION GUIDELINES

Time: *45 Minutes*

Group Activity

STEP I - Review the key words, if necessary.

STEP II - State the purpose of the activity: to work with square roots and perceive the use of this skill in the professional world.

STEP III - Read and discuss the cartoon and the answers to "Why would anyone be a math teacher?"

STEP IV - Read and guide discussion of Puzzles, Looking It Up, and Following a Plan. This is the time to review and reinforce the divide-and-average method of finding the square root of a perfect whole number.

Individual Activity

STEP V - Make sure students understand how to do "Solving a Puzzle." Students will then work individually.

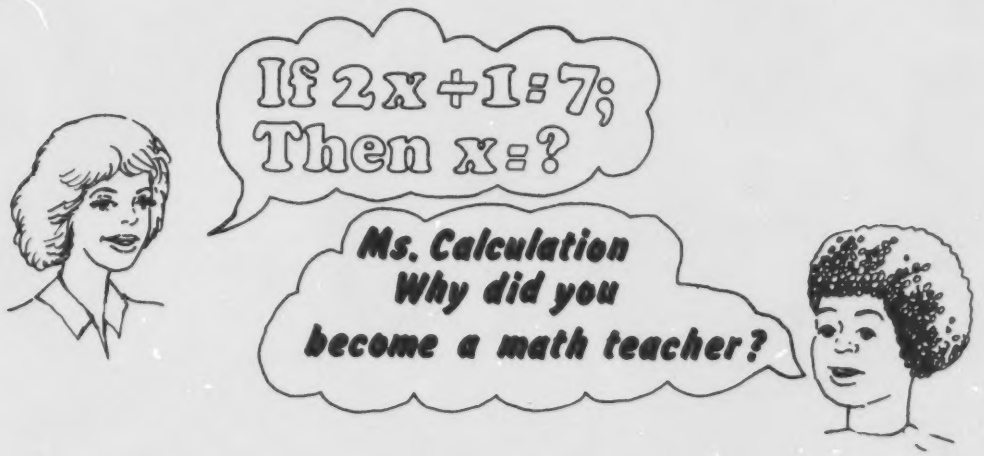
Evaluation

STEP VI - The evaluation is to be completed by students working individually.

STEP VII - The Home and Community activities will be carried out provided there is ample time.

STUDENT ACTIVITY MATERIAL

Math Teachers



Have you ever wondered why anyone would want to be a math teacher? Here are some of the reasons Ms. Calculation gave her students.

"I decided to be a teacher because teaching is a service job, and I wanted to work in public service."

People with jobs in public service work for their local, state, or federal government. Ms. Calculation is employed by the people of her community.

"I decided to be a teacher because I like working with people, especially kids."

Ms. Calculation's first two answers tell why she decided to be a teacher. Her students still want to know why she decided to be a math teacher.

"I decided to be a math teacher because I love to work puzzles".

PUZZLES?

Yes, puzzles. People who enjoy mathematics are usually people who enjoy puzzles. Looking for the answer to an equation can be just as much fun as trying to find just the right piece to fit in a jigsaw puzzle. Let's see how solving a math problem--finding the square root of whole numbers, for example--is like a puzzle.

LOOKING IT UP

Sometimes puzzle workers just can't think of the answer. Then they turn to the Solution section of their puzzle book and look it up. We can do this for some square roots too.

TABLE OF SQUARE ROOTS

n	n^2
1	1
2	4
3	9
4	16
5	25
6	36
7	49
8	64
9	81
10	100
11	121
12	144
13	169
14	196
15	225

1. What is the square root of 169?
2. What is the square root of 225?
3. What is the square root of 25?

FOLLOWING A PLAN

Sometimes puzzle workers follow a plan. For example, you may plan to fill in all the Down words and then all the Across words in your crossword puzzle.

Here is the divide-and-average plan for finding square roots.

Problem: $\sqrt{576}$ = ?

Plan

Name the number x. ..... $\sqrt{576}$

Estimate the square root of x. ..... $\sqrt{576} = 25$ (We know that $\sqrt{400} = 20$.)

Divide x by the estimate ..... $25\overline{)576}$

$$\begin{array}{r} 23 \\ -500 \\ \hline 76 \\ -75 \\ \hline \end{array}$$

Are the divisor and quotient equal? ..... No. 25 23.

YES — Stop. This is the square root.

NO — Average the divisor and the quotient ..... $\frac{25 + 23}{2} = 24$

Divide x by the average. ..... $24\overline{)576}$

$$\begin{array}{r} 24 \\ -480 \\ \hline 96 \\ -96 \\ \hline \end{array}$$

$24 = 24$

So, $\sqrt{576} = 24$

11

8

SOLVING A PUZZLE

Use the divide-and-average method to get through this maze with a total of 138 points. You must start at an outer gate and pass through only six gates. When you add up the points from each gate, they must total exactly 138 points.

Here is the winning route.

Start at $\sqrt{1936}$

Go to gate $\sqrt{81}$

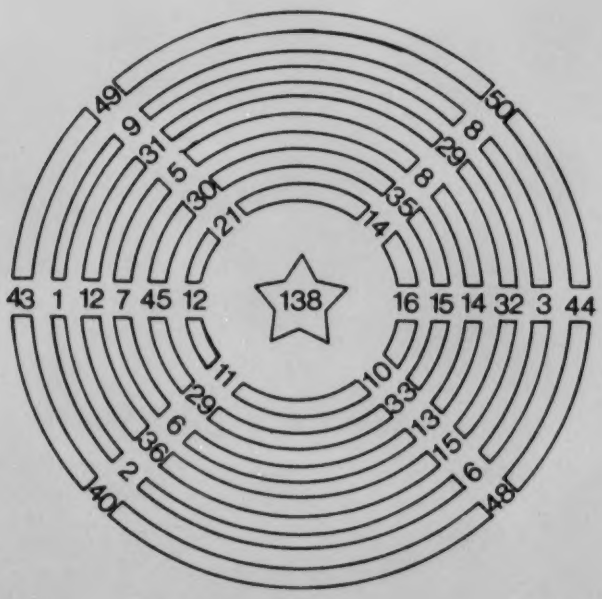
Now go to gate $\sqrt{1024}$

Now go to gate $\sqrt{49}$

Now go to gate $\sqrt{1225}$

The last gate is $\sqrt{121}$

Add up the points from each gate. Did you win?



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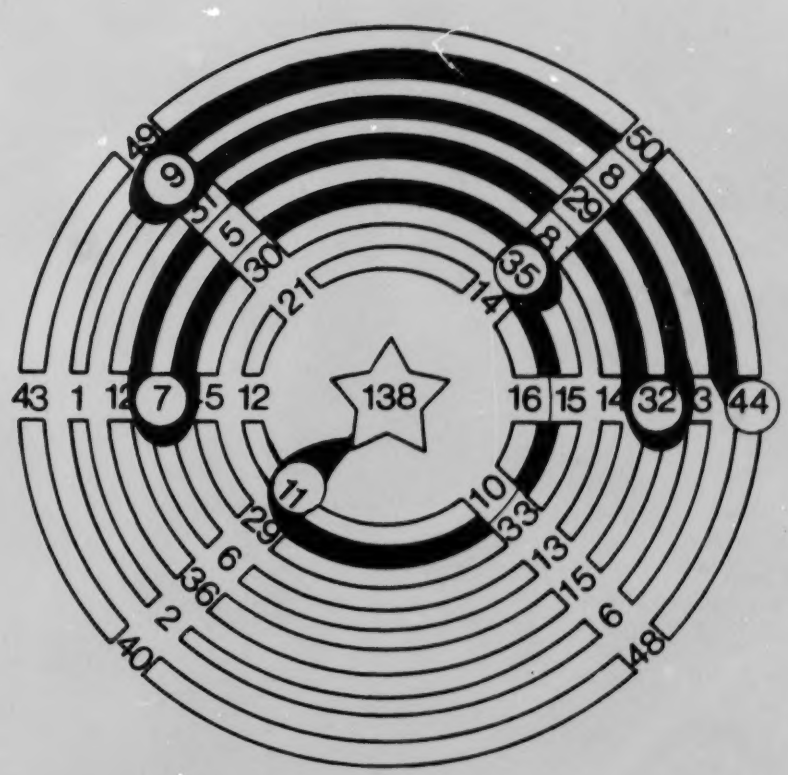
Answer Key

Solving a Puzzle



HOME and COMMUNITY

9

Students may interview family member(s) to find out if math skills are necessary in their jobs, especially square roots. They may report the results of the interview to the class. Students may use the school or public library to find books on mathematical puzzles. They will copy down one puzzle which they think is fun to do and present it to the class. The class may compile a volume of mathematics puzzles.

EVALUATION

1. What kind of a job is teaching?

   _____

2. Why does Ms. Calculation, the math teacher, like mathematics?

   _____

   _____

3. What method can you use to find $\sqrt{2704}$?

   _____

4. Do these problems.

   a. $\sqrt{729}$ = b. $\sqrt{961}$ =

ANSWER KEY

1. Public Service
2. Solving math problems can be like working puzzles.
3. Divide-and-average
4. $\sqrt{729} = 27$

   $\sqrt{961} = 31$

COMPONENT I
Section Two

Section Two
Managing the City Budget

Learning Objective

Given a description of the city manager's job, and focusing on the idea that wages are what someone is paid for time and effort expended, the students will determine gross and net pay with at least 75% accuracy.

Key Words

- wage
- salary
- overtime
- gross pay
- net pay
- Public Service

Domains and Levels

Cognitive: Knowledge, Application

Affective: Receiving

Materials

- one copy of the narrative for each student. (Optional)
- overhead or opaque projector.
- transparencies of Charts A, B, C, and D.

IMPLEMENTATION GUIDELINES

Time: *45 Minutes*

Note: The ability to figure gross and net pay is a life skill which will help prepare students for getting along successfully in life.

Group Activity

STEP I — Introduce the activity with a question and brief discussion. For example, "What are some jobs done by people who work for our city?" or, "Who do you suppose decides how much city workers will be paid?"

STEP II — State the purpose of the activity: to learn about wages and salary in the professional world.

STEP III — Read and discuss Part A. (Project Chart A if desired.)

STEP IV — Read and discuss Part B. Stress these key words: salary, wage, and overtime. (Project Chart B if desired.)

STEP V — Solve the problems in Questions to Answer, either as a group or individually.

STEP VI — Read and discuss Part C. Stress these key words: gross pay and net pay. (Project Chart C.)

STEP VII — Read and discuss Part D. (Project Chart D.)

STEP VIII — Solve the problems in Questions to Answer, either as a group or individually.

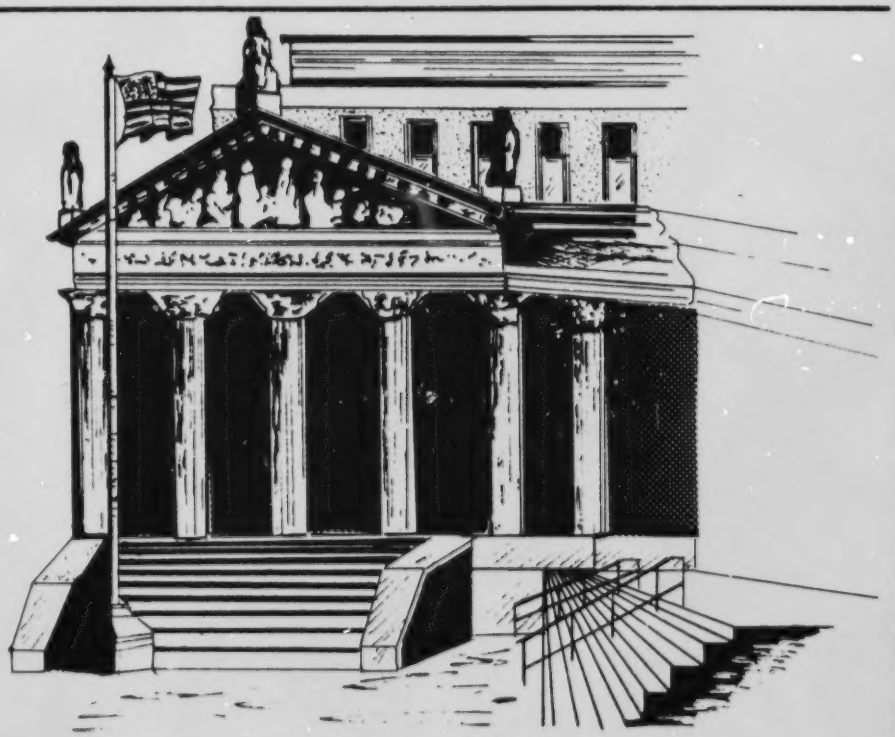
Evaluation

STEP IX — The evaluation is to be completed by students working individually.

STEP X — The Home and Community activities may be completed if time permits.

STUDENT ACTIVITY MATERIAL

Part A



CITY MANAGER

Calvin Turner is a city manager. His job is one of public service. He works for the people, and he is employed by his local government. Mr. Turner is in charge of the day-to day operation of the city. He must study city problems and report his findings to the city council. He also hires people to head city departments.

One of the most important parts of his job is preparing the city budget. The budget tells how much will be spent in the coming years in all departments of the city government.

One of the departments listed in the budget is the Animal Shelter. The people in this department are in charge of animal disease control and stray animal control. The workers at the Animal Shelter have public service jobs, too.

Chart A shows part of the budget Mr. Turner has prepared. You can see that the largest part of the budget goes for salaries and wages. A salary, or wage, is money paid to a worker for his or her time and effort.

Animal Shelter
Department No. 430
198— Approved Budget

A.	Salaries and Wages	$237,315
B.	Supplies	26,595
C.	Maintenance	7,280
D.	Special Services	5,555
E.	Capital Outlay	38,175
	TOTAL	$314,920

Chart A

Part B

The next page of the city budget show the salaries and wages of the Animal Shelter workers. A salary is a set amount of money, paid to the worker on a regular basis, often monthly. A wage is payment for work done, usually figured on an hourly basis.

The Animal Shelter budget also shows $7,935 set aside for overtime. Overtime is a higher wage paid to a worker when that person works for more than a set number of hours in a week. Overtime is often paid when a worker works more than 40 hours in a week. Many times workers get time-and-a-half for overtime. Here is an example:

Wages: $4.00 per hour

22 Time-and-a-half: $4.00 + $2.00 = $6.00

PERSONNEL SCHEDULE

Animal Shelter Department
198___

SALARIES	Salary	No. Employees	Total Salaries	
Administrative and Clerical			Salaries	
Senior Clerk	$796/mo.	1	$9,552	
Operations				
Animal Control Supervisor	$1340/mo.	1		
Chief Animal Inspector	1246/mo.	1		
Animal Control Inspector	1036/mo.	12		
		14	180,216	Total
WAGES				
Kennel Attendant	$5.00/hr.	1		
Dispatcher	5.55/hr.	1		
			21,100	Total
Salaries and Wages				
Overtime			7,935	

Chart B

Chart B

Questions to answer for chart B

1. What will the Animal Control Supervisor's gross salary be for one year?

2. If the kennel attendant works for 40 hours one week, how much will the gross wages be for that week?

3. If the Dispatcher works 176 hours in a month, how much will the gross wages be for that month?

4. The kennel attendant is paid time-and-a-half for overtime (over 40 hours a week). What will the kennel attendant's wages be for 48 hours of work?

Part C

Another listing in the city budget is the Fire Department. The job of a firefighter is an important one in public service. One part of the budget shows the money approved for the salaries and wages of 163 firefighters in Mr. Turner's city. On Chart C, you can see that some of the money will go to Social Security, retirement funds, and insurance.

Fire Department No. 220
198_ Approved Budget

SALARIES AND WAGES

Supervision	$ 59,064
Administrative and Clerical	32,731
Operations	2,622,312
Overtime	8,000
Workers' Compensation	73,148
Employees' Retirement	143,864
Social Security	175,754
Employees' Insurance	87,730
	$ 3,202,603

Chart C

Part D

When a person receives a paycheck, some money has been subtracted from the wages for such things as Social Security and taxes. The person's total wages or salary is called gross pay. The amount which the person actually takes home, after the subtractions are made, is called net pay. Chart D shows part of the paycheck received by the Fire Chief in Mr. Turner's city.

Fire Chief City, State	Gross Pay 2,166.00	Withholding Tax 286.28	
Social Security #	Hospital Ins. 135.42	Life Ins. 10.24	Retirement 144.04
			Net Pay 1,590.02

Chart D

Questions to Answer for chart D

1. How much less is the Fire Chief's net pay than the gross pay?

2. The Fire Inspector has a gross monthly salary of $1,575. If $412.68 is deducted, what is the net pay?

3. A beginning firefighter earns a gross monthly salary of $982.00. If the firefighter's net pay was $813.48, how much was deducted?

4. The Assistant Fire Chief has a gross yearly salary of $21,164. During the year a total of $2,946.58 was deducted from the paycheck. What was the Assistant Fire Chief's net pay for the year?

Answer Key

Chart B	Chart D
1. $16,080.00	1. $575.98
2. $200.00	2. $1,162.32
3. $976.80	3. $168.52
4. $260.00	4. $18,217.42

HOME and COMMUNITY

Home: The students may discuss any of the following questions with family members.

1. Do you, or any of our relatives, work for the city government?
2. Are your wages figured by the hour or are you paid a yearly salary?
3. Are you ever paid for overtime work?
4. Is there a big difference between your gross and your net pay?

EVALUATION

Answer the following problems:

1. Name three jobs in public service which are done for the city.

   _____

   _____

   _____

2. What is the difference between salary and wages?

   _____

   _____

3. A worker makes $5.60 an hour and time-and-a-half for overtime (over 40 hours). What is the worker's gross pay for 44 hours?

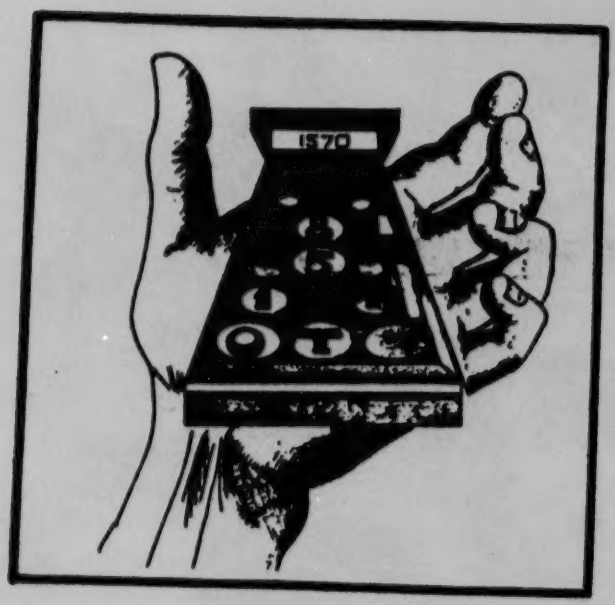
4. A worker makes $1,638.00 a month. If $436.85 is deducted from the worker's paycheck, what is the worker's net pay?

EVALUATION

Answer Key

1. City manager, firefighter, animal control supervisor (or other)
2. Salary is a set amount for job, usually paid monthly

   Wage is amount of money paid for work done, usually figured hourly
3. $257.60
4. $1201.15



COMPONENT I
Section Three

Section Three
Looking for Clues

Key Words

. average

. detective

Learning Objective

Given a narrative about the police detective's job, including situations in which a detective might need to use mathematics, the students will solve stated problems involving whole numbers with 80% accuracy.

Materials

one copy of the narrative for each student.

Domains and Levels

Cognitive: Knowledge, Application, Analysis

Affective: Receiving, Responding

IMPLEMENTATION GUIDELINES

Time: *45 Minutes*

STEP I - State the purpose of the activity: to learn how the detective might use math and to solve stated problems involving whole numbers.

STEP II - Read and discuss the Introduction. This may be done as a group or individually.

Individual Activity

STEP III - Students will solve the problems in Case #1 and Case #2. (The more capable students may also do the problems in "It's All in a Day's Work.") The teacher may wish to have students correct their work as soon as they are finished.

STEP IV - The evaluation is to be completed by students working individually.

STEP V - The Home and Community activities will be assigned if time allows.

STUDENT ACTIVITY MATERIAL

Introduction

Have you ever wanted to be a detective? If you have watched many detective shows on T.V., you may think a detective's life is exciting and glamorous. After all, the Hardy Boys and Nancy Drew seem to have great adventures while solving mysteries.

But real-life detectives are different from those on T.V. and in books. A detective's job is actually very difficult. A good detective must not be afraid of hard work. Some cases take months or years to solve. A good detective must also be observant, in order to find out who, what, when, where, and why. And, a good detective must not be afraid of danger.

Why would anyone want to be a detective? People who choose to be police detectives enjoy having jobs in public service. The detective's job is to enforce the law and to protect the public from crime. Detectives may be employed by their local, state, or national government. Most detectives take great pride in working for the people in their communities.

Now, let us suppose that you are a police detective. You like hard work, you are observant, and you are not afraid of danger. On your first case you find out that you need one more ability. You must be accurate when you work math problems!

Work on these two "cases" to find out why.

CASE #1

"The Grocery Store Break-In"

Mr. Smith is the manager of The Corner Grocery Store. Last Friday night, Mr. Smith locked up the store at 11:00 p.m. He went home. At 1:00 a.m., the town police drove by on patrol. The police car headlights reflected on the store window. Everything looked normal.

On Saturday at 7:00 a.m., Mr. Smith came to open the store. He saw that the store window was broken. When he went inside, he realized that burglars had been in the store.

1. During how many hours could the burglary have occurred?

2. On Friday night there was $82.00 in the cash register. On Saturday morning Mr. Smith found only $13.00. How much was taken?

3. Mr. Smith noticed that the burglar also took 19 cases of soda pop. Each case was worth $3.00. How much was the stolen soda worth?

4. Mr. Smith found that nothing else had been taken. What was the total value of the theft?

5. If it will cost Mr. Smith $240.00 to repair the broken window, what was the total value of the store's loss?

6. Would the answers to these questions be helpful to a detective? How?

Answer Key to Case #1

1. 6 hrs.

2. $69.00

3. $57.00

4. $126.00

5. $366.00

6. Any reasonable answer will be accepted.

CASE #2

The Case of the Stolen Car

Jo Hiram is the owner of "Jo's Used Car Lot." Whenever a car is put on the lot for sale, Jo writes down the car's serial number, the mileage, and other information about the car.

One winter afternoon, around 5:00 p.m. Jo showed a car to a customer. After the customer left, Jo went back to the office. At 6:00 p.m., Jo returned to the lot. She found the car gone.

Jo called the police. Later that same night, at 11:45 p.m., the police found the car.

1. The mileage on the car before the theft was 48,652. When the police found the car, the mileage was 48,937. How many miles did the thief drive the car?

2. The police found a suspect. The suspect had several witnesses who were with him at work from 8:00 a.m. to 5:00 p.m. on the day of the theft. The suspect had another witness who was with him at a party from 7:00 until midnight on the evening of the theft. How many hours after 8:00 a.m. were not covered by witnesses? Were these hours at the same time as the car theft?

3. Assume that the thief drove an average of 60 miles per hour. How long would it have taken the thief to drive the car the number of miles it went? (See problem one.)

4. Do you think the suspect stole the car and drove it? Why or why not?

Answer Key to Case #2

1. 285 miles

2. 2 hours - these were the same hours that the car theft occurred.

3. 4 hours, 45 minutes

4. No, because he did not have time.

40

BONUS "It's All In a Day's Work"

Sam Clue is a police detective in a city of 150,000 people. Every year he makes a report to the police department. The report tells about the cases he has worked on during the year.

1. Sam worked on an average of 85 cases a month. About how many cases did he work on during the year?

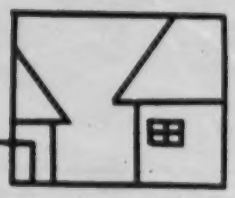
2. In January, Sam worked on 90 cases. One half of these cases involved theft. How many theft cases did he handle?

41

3. Of the cases Sam worked on last year, one-tenth have not been solved yet. How many cases have not been solved? (See problem one)

4. Sam's partner, Carla, worked on 912 cases last year. How many did she average each month?

HOME and COMMUNITY



Many cases which the police are involved in are reported in the daily newspaper and on television. The students will read, or watch, the news to see if they can find cases in which a police detective might use numbers in working on the case. The students may discuss these cases on a subsequent day.

EVALUATION

1. The police detectives in Baytown handled 347 cases last year. Of these cases, 159 were burglary cases. One half of the remaining cases were auto theft cases. How many auto theft cases did the detectives handle?

2. In one five-day week, Detective Brown drove 1,325 miles while investigating cases. How many miles did he average each day?

Component 2

Section One

Section Two

Section Three

USING FRACTIONS IN MARKETING AND DISTRIBUTION

45

Introduction

This component is designed to show students how jobs in the Marketing and Distribution Cluster require the ability to solve problems using fractions. Students will see in the first section how designers use fractions in concepts of style and manufacturing processes. Using the four basic operations, the students will solve stated problems analogous to the designers' job functions. In the second section, the students will discover the importance of variables such as distance, rate, and time, as they figure into the job orientations of manufacturer's representatives. Given the values of two of the three variables, the students will determine the third by employing the use of fractions implied in or provided by sample itineraries. In the third section, the students will write and solve simple proportions as they relate to the job duties of Merchandising Managers.

GOALS

MOTIVATION: The students will solve stated problems involving fractions and whole numbers, using the four basic operations.

APPLICATION: The students will determine the values of the unknown variable when two of three: distance, rate, and time, are given.

ORIENTATION: The students will write and solve problems in proportions.

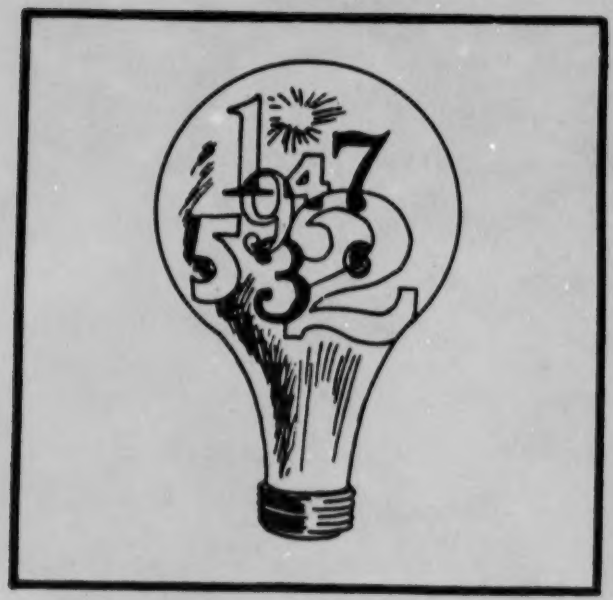
LEARNING SECTIONS

Section 1: Sizing-Up Fractions

Section 2: Rating Timed Distance

Section 3: Retailing Along Proportional Lines

47



COMPONENT II
Section One

Section One
Sizing-Up Fractions

38

Learning Objective

Given stated problems involving fractions and whole numbers, the students will solve the problems, using the four basic operations, with 70% accuracy.

Key Words

- fractions
- proportions
- reciprocals
- commutative property
- denominator
- divisor
- quotient
- marketplace
- designer
- activewear
- pannier

Domains and Levels

Cognitive: Knowledge, Application, Analysis, Synthesis

Affective: Receiving, Valuing

Materials

- copies of the narrative
- evaluation

51

IMPLEMENTATION GUIDELINES

Time: *45 Minutes*

Group Activity

STEP I - Review, define, and discuss the key words, if necessary.

STEP II - State the purpose of the component to the students: to see how designers who work in the field of marketing and distribution solve problems involving fractions and whole numbers.

STEP III - Have the students read and discuss the narrative. Allow time for the students to work collectively on matching the clothing descriptions with the fractional notations in exercises A through H, then reinforce the practical use of fractions from a designer's point of view.

STEP IV - Guide the students through the section, "What Is the Key to Success," and review with them the four basic operations using fractions and whole numbers.

Individual Activity

STEP V - Make sure the students understand the "Bill of Material." Then have them work individually on the problems which follow.

Evaluation

STEP VI - Read through the evaluation exercise with the students, and clarify any points which may be misunderstood. (If the students as a whole did not achieve accuracy on the previous activity, introduce the evaluation with a quick review of the steps in solving the most frequently missed answers.)

STEP VII - Have the students work individually on the evaluation exercise.

STEP VIII - (Optional). Discuss the evaluation answers with the students to be certain they have fully grasped the use of fractions in the chosen career.

STEP IX - The Home and Community activity is optional, to be completed if time permits.

STUDENT ACTIVITY MATERIAL

SIZING-UP FRACTIONS

How often have you gone shopping for sportswear -- not just T-shirts and blue jeans -- but sportswear designed for action for players on the move?

action on the *move*

Styles in "active" sportswear are as much a part of the sports they represent as the players who participate in them. If you have ever been running during the scorching summer months, for example, you may already know that light-weight tank shirts and shorts with side splits make for easier movement and faster "cooling off."

If you have been among those who brave the ice and snow, you may have found that hooded sweatshirts and snug-fitting pants help keep your body warm and its temperature constant.

Today, whatever the sport, whatever the season, there is an outfit made specifically for fashion and function. Knowing which design is best for your favorite sport will not only help save you money, but it will also help cut down on the time you spend shopping around for your own activewear.

"Is this difficult to learn," you ask?

Not at all!

If you understand **fractions**, you can master

DESIGNS!

Why don't we try an experiment? Let's pretend you are wandering through a sporting goods store. Suddenly, you see a display advertising the following sports' styles. Could you identify these designs, using your knowledge of fractions?

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Try it and see!

Simply match the clothing descriptions, written beside the designs, with the fractional equivalents in A through H. You may be surprised at what you learn!

Basketball

Warm-up Suit

Football

Crop Top Jersey

Knickers

Soccer

Soccer Shirt

English Rise Shorts

Skating

Cap Sleeve Shirt

Pleated Pannier

Gymnastics

Exercise Suit

A. 1/2 sleeve shirt with "V" neck collar: _____

B. 3/4 pants with elastic knee bands: _____

C. 4/4 or full-length pants with zip-up long sleeved jacket: _____

D. 1/4 sleeve shirt: _____

E. 4/4 or one-piece, long sleeved suit with "U" shaped neckline: _____

F. 5/8 sleeved, 3/4 shirt with "U" shaped neckpiece: _____

G. 1/4 length shorts with 1/8 inch side split: _____

H. 1/2 skirt with 1/3 split front panels: _____

If you got half of your answers right, you may be on your way to a career in designs for sports spectators and sports participants. Though designers of active sportswear represent only a fraction of the entire manufacturing process, they have a large part to play in today's world of the sports-minded. Whether they create styles for football, baseball, soccer, or gymnastics, they are specialists who understand not only sports but the needs of players.

Like players, designers are competitors. Winning to them is making fashionable, useful outfits that are low in price but high in quality. Meeting the challenge involves studying the styles, colors, textures, and fabrics which are suitable for individual sports. Making these raw materials into outfits, which stores will sell and sports enthusiasts will buy, means acceptance and success in the marketplace.

WHAT IS THE KEY TO SUCCESS?

Bill of Material

Outfit: Football Crop Top
Knee Britches

Size: Small

Materials	Amounts	Costs
Gray nylon (top)	1/2 yd	$ 1.15
Gray nylon (bottom)	3/4 yd.	$ 2.40
Elastic	32 in.	$ .20
Black trim (top)	16 in.	$ .30
Black trim (bottom)	48 in.	$ .90
Clear Thread	As required	$ .30
Black Thread	As required	$ .15
	Total:	$ 5.40

To designers, "Bills of Materials" are the most important tools in the manufacturing process. They tell which outfit is to be made, its size, how much material is to be used, and what the final manufacturing costs will be. Because these facts serve as guides for producing hundreds of outfits for marketing in stores, designers must be able to work fractions and solve problems in proportions. Let's review their operations.

... To find the sums and differences between fractions with unequal denominators, designers first rename the fractions and find equivalent expressions: for example, $\frac{3}{5} + \frac{1}{4} = ?$ $\frac{3}{5} - \frac{1}{4} = ?$

a. $\frac{3}{5} = \frac{3 \quad 4}{5 \times 4}$

$\frac{3}{5} = \frac{12}{20}$

b. $\frac{1}{4} = \frac{1 \quad 5}{4 \times 5}$

$\frac{1}{4} = \frac{5}{20}$

c. $\frac{3}{5} + \frac{1}{4} = \frac{12}{20} + \frac{5}{20}$

$= \frac{17}{20}$

d. $\frac{3}{5} - \frac{1}{4} = \frac{12}{20} - \frac{5}{20}$

$= \frac{7}{20}$

... To name the products of fractions and whole numbers, designers use the commutative property of multiplication:

$20 \times \frac{1}{4} = \frac{20}{1} \times \frac{1}{4}$

$= \frac{20 \times 1}{1 \times 4}$ (commutative property)

58 $= \frac{20}{4} = 5$

... To name the quotients of whole or mixed numerals divided by fractions, designers simply multiply by the reciprocal of the divisor:

$$20 \div 1\frac{1}{4} = 20 \div \frac{5}{4}$$

$$= \frac{20}{1} \times \frac{4}{5} \quad \text{(reciprocal)}$$

$$= \frac{20 \times 4}{1 \times 5} \quad \text{(commutative property)}$$

$$= \frac{80}{5}$$

$$= 16$$

Using these examples as guides, could you solve similar problems if you were a designer?

1. Look at the sample "Bill of Material" on the previous page. What is the total number of yards of gray material used on the jersey and knee britches? _____

2. If 400 outfits are to be made, how many yards of gray material will be used? _____

3. How many inches of the black border trim are used on the jersey and knee britches? _____ If this is purchased by the feet only, how many outfits can be trimmed if 32' are bought? (Hint: 12" = 1') _____

4. If the combined threads represent 1/12 of the total cost, what portion does "clear" thread represent, if black thread is 1/36 of the cost?

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_____

ANSWER KEY: SIZING-UP FRACTIONS

A. Soccer Shirt

B. Knickers

C. Warm-up Suit

D. Cap Sleeve Shirt

E. Exercise Suit

F. Crop Top Jersey

G. English Rise Shorts

H. Pleated Pannier

1. 1 1/4 yds. or 5/4 yds.
2. 500 yds.
3. 64 inches; 6 outfits
4. 1/18

HOME and COMMUNITY

After scanning magazines, newspapers, and catalogs for illustrations of clothing designs, the students should write fractional descriptions of their favorite styles and indicate how the designs contribute to the over-all effectiveness of the garments.

EVALUATION

Answer the following:

1. Designers of active sportswear frequently use fractions to describe their styles for football, soccer, gymnastics, and skating. True or False: _____

2. Designers are competitors trying to make fashionable, useful outfits which stores will sell and consumers will buy. True or False: _____

3. Why is a "bill of material" important to a designer? _____

_____

4. If you were designing a gymnastics suit which required a total of 5/8 yards of powder blue material, how many yards of material would be needed if you were to manufacture 200 outfits? _____

5. If 32 inches of yellow border trim are used on each warm-up suit made, how many outfits can be trimmed if 96 feet of the trim are purchased?

_____

6. If football jerseys and knickers combined represent 3/4 of all your designs, what portion would the jerseys themselves represent, if the knickers represent 1/3? _____

EVALUATION

Answer Key

1. True
2. True
3. Answers will vary, but they should reflect the explanation given in the narrative.
4. 125 yards
5. 36 outfits
6. 5/12

COMPONENT II
Section Two

Section Two
Rating Timed Distances

Learning Objective

Given the values of two of three variables: distance, rate, and time, the students will determine the third variable, employing the use of fractions, with 70% accuracy.

Key Words

- distance
- rate
- time
- marketing
- distribution
- percentage
- commission
- middlemen
- manufacturer's representatives
- itinerary

Materials

- copies of the narrative
- evaluation

Domains and Levels

Cognitive: Knowledge, Application, Analysis, Synthesis

Affective: Receiving

IMPLEMENTATION GUIDELINES

Time: *45 Minutes*

Group Activity

STEP I - Introduce the activity with a question or two related to selling. For example: If you could select one item that you would like to sell to others, what would it be? How would you persuade others to purchase this product?

STEP II - Allow time for student responses, then review, define, and discuss the key words, if necessary.

STEP III - State the purpose of the activity to the students: to see how manufacturer's representatives use factors such as distance, rate, and time in planning their marketing strategies and travel activities.

STEP IV - Have the students read and discuss the narrative.

STEP V - Reinforce the concept of itineraries and review the formulas for computing the unknown variable in distance, rate, and time problems.

STEP VI - Stress the importance of expressing variables as fractions whenever possible. (e.g. 1.5 hours = 1 1/2 hours)

Individual Activity

STEP VII - Make sure the students understand the use of the map. Then have them work individually on the problems which follow.

Evaluation

STEP VIII - Read through the evaluation exercise with the students and clarify the use of the itinerary. (If the students did not achieve accuracy on the previous activity, review those problems most frequently missed.)

STEP IX - Have the students work individually on the evaluation exercise and discuss the correct answers with the class following completion.

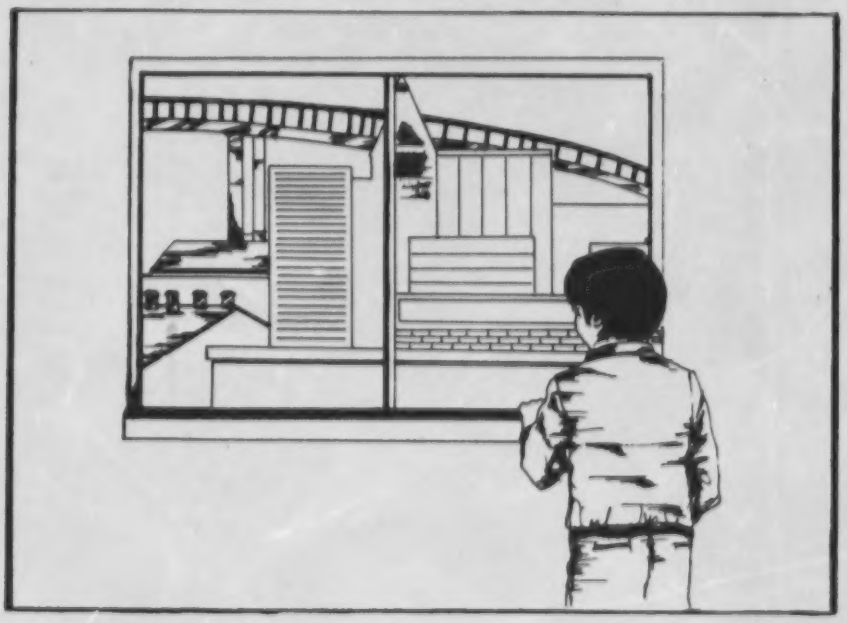
STEP X - The Home and Community section is optional, to be completed if time permits.

STUDENT ACTIVITY MATERIAL

RATING TIMED DISTANCES

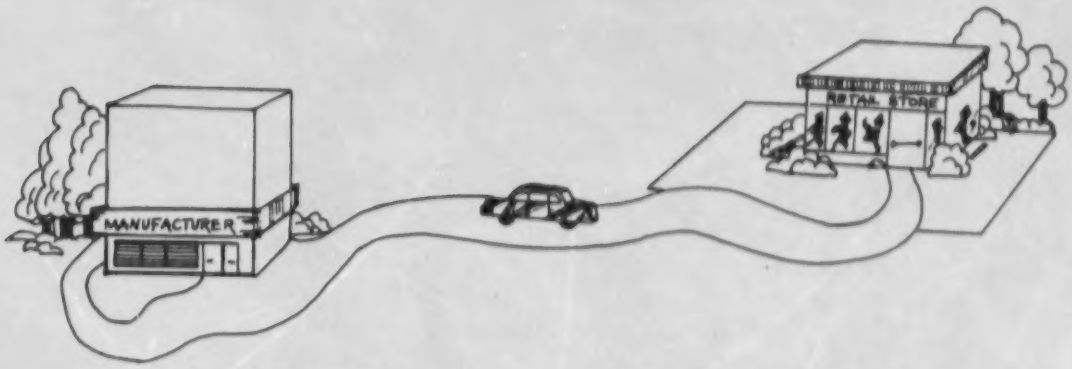
Do you ever tire of the hum-drum of inside work?

Are there times when you find yourself wishing you could be outside, finding your own way, providing for others, trying new things?



In the world of marketing and distribution, there are jobs which offer you the best of both life styles.

In the sporting goods industry, inside and outside positions are held by manufacturer's representatives, who promote products and create product demands between producers and consumers.



As part of the sales team, these middlemen share in the responsibilities of marketing. They are hired by manufacturers to represent their products to buyers. They are used by buyers to represent their good-will and interests to manufacturers.

Percentage		Total Sales		Commission
$\frac{1}{10}$	X	\$1,000.00	=	\$100.00

Because their salaries are based upon commission, which is

a percentage (usually 1/10) of their total sales, manufacturer's representatives view selling not only as an art, but as a challenge to earning a living!

WHAT IS THE KEY TO SUCCESS?

To be successful, representatives study their company and its products. They analyze the competition and look for ways of securing interviews with established buyers.

Through sporting goods trade shows or private appointments, they quote prices, provide information, make presentations of their products, and try to learn the needs of their customers. If customers write orders for their products, the "reps" can measure success from their percentage of the total sales. If no orders are written, then the reps must seek out new territories, look for new customers, try new sales techniques.

SKILLS TO REACH THE GOAL

In marketing sporting goods, the goal of manufacturer's representatives is to pave the way for profitable selling. Department stores, sporting goods stores, and specialty shops must be contacted and interviewed---not in one city alone, but often in an entire state! For "reps", this involves many hours of outside travel.

Since time spent on the road can be very costly, representatives follow an itinerary, or travel plan. Such a plan shows them the account to see, its location, its distance from the home office, the rate of travel, and the approximate traveling time.

ITINERARY

Account:

Rivera's Department Store	Pasadena	192.5 miles	55 m.p.h.	3 1/2 hours
All Sportsway	Baytown	22 miles	55 m.p.h.	2/5 hours
Soccer Center	Springdale	67.5 miles	45 m.p.h.	1 1/2 hours

To use an itinerary effectively, manufacturer's "reps" must have good math skills and be able to solve problems using fractions! When a factor such as "distance" is not known, they must use the other known factors to complete the information.

By following simple formulas, here is how they arrive at their data:

Distance = Rate X Time

? = 55 m.p.h. X 3 1/2 hours

? = 55 x 3 1/2

$? = \frac{55}{1} \times \frac{7}{2}$

$? = \frac{385}{2}$

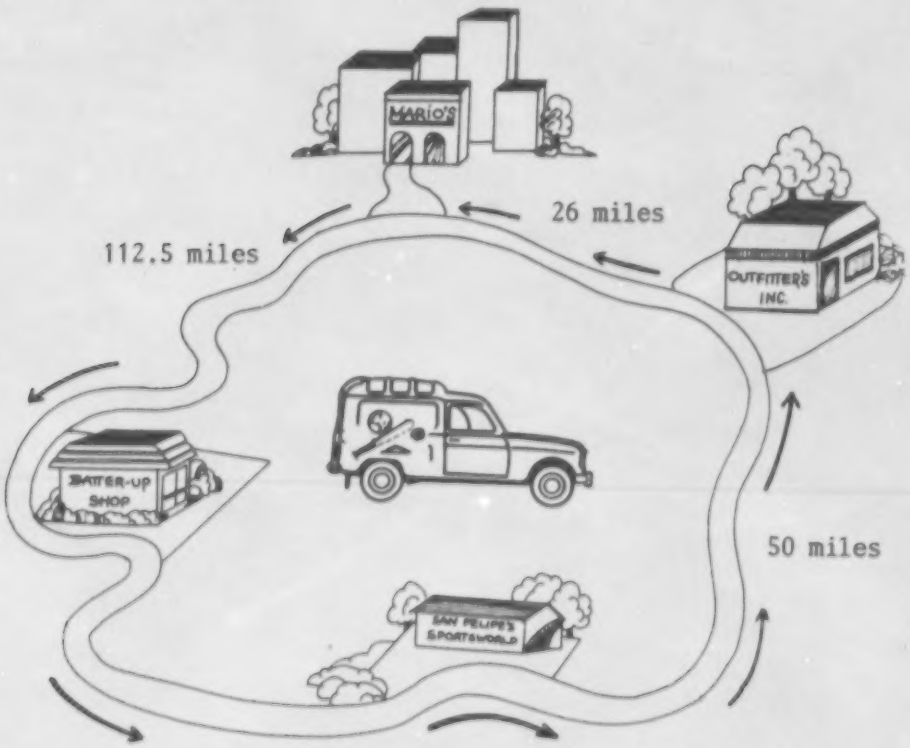
? = 192.5 miles or 192 1/2 miles

Rate	=	Distance	÷	Time
?	=	22 miles	÷	2/5 of an hour
?	=	$22 \div \frac{2}{5}$		
?	=	$\frac{22}{1} \times \frac{5}{2}$		
?	=	$\frac{110}{2}$		
?	=	55 m.p.h.		

Time	=	Distance	÷	Rate
?	=	67.5 miles	÷	45 m.p.h.
?	=	$\frac{67.5}{45}$		
?	=	1.5		
	=	$1\ \frac{5}{10}$		
	=	$1\ \frac{1}{2}$ hours		

If you had a position as a manufacturer's representative, could you solve similar problems using fractions?

Why don't we find out?



As a representative of baseball uniforms manufactured by the Outfitters, Incorporated, you must call upon the stores shown in the map above:

1. If you are traveling at the rate of 45 miles per hour, approximately how long will it take you to reach the Batter-Up Shop from Mario's?

   _____

2. Since your sales call at the Batter-Up Shop, you have been traveling at the rate of 55 miles per hour. If you arrive at San Felipe's

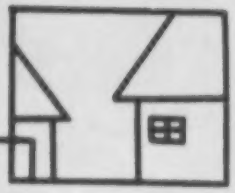
Sportsworld after traveling a total of 1 1/2 hours, how many miles will you have driven? _____

3. The distance from San Felipe's Sportsworld to the manufacturer's home office is 50 miles. If it is now 4:00 in the afternoon and you wish to reach the Outfitter's by 5:15, what rate must you travel to keep within your schedule? _____

ANSWER KEY

1. 2.5 hours
2. 82.5 miles
3. 40 miles per hour

HOME and COMMUNITY



Using the family road map or an individually formulated map, the students may plan an imaginary trip. Perhaps the trip might be to visit out-of-town relatives or to an amusement center. An itinerary should be planned which shows the distance, rate, and time involved in the proposed travel plan.

EVALUATION

Answer the following:

1. Manufacturer's representatives are middlemen who promote products and create product demands between producers and consumers. True or False:_____

2. Manufacturer's representatives are paid commission, which is a percentage of their total sales to customers. True or False:_____

3. The goal of manufacturer's representatives is to pave the way for profitable selling either by securing interviews with established buyers or by seeking out new territories and new customers. True or False:_____

4. As a manufacturer's representative, you are planning an itinerary so that you can call on the following customers. From previous trips, you have obtained most of the information for your travel, but some of the factors are unknown. Can you solve for the missing factors indicated on the chart below?

ITINERARY

Account	Location	Distance	Rate	Travel Time
a. Tejeda's Department Store	Parker Heights	?	50 m.p.h.	3 1/2 hrs
b. Sportsman's Paradise	Shadow Mountain	99 miles	45 m.p.h.	?
c. The Pinch Hitter's Shop	Diamond Pass	45 miles	?	1 1/8 hrs

EVALUATION

Answer Key

1. True
2. True
3. True
4. a. 175 miles

   b. 2 1/5 hours (or 2.2 hours)

   c. 40 m.p.h.

COMPONENT II

Section Three

Section Three
Retailing Along Proportional Lines

Learning Objective

Given the "product rule" in testing for fractional equivalents, the students will write and solve simple proportions analogous to the job functions of merchandising managers, with 70% accuracy.

Key Words

- proportions
- percentages
- mark-up
- retailing
- merchandising manager
- product rule
- ratio

Domains and Levels

Cognitive: Knowledge, Application, Synthesis

Affective: Receiving

Materials

- one copy of the narrative for each student.
- evaluation

IMPLEMENTATION GUIDELINES

Time: *45 Minutes*

Group Activity

STEP I - Review, define, and discuss the key words, if necessary.

STEP II - State the purpose of the activity: to see how merchandising managers apply their knowledge of fractions and the product rule in solving problems in proportions.

STEP III - Have the students read and discuss the narrative.

STEP IV - Reinforce the "product rule" and, if necessary, restate the method for writing an equivalent of a given fraction: i.e., simply multiply both numerator and denominator by the same whole number greater than 1.

Individual Activity

STEP V - Have the students work individually on the problems involving proportions.

STEP VI - Discuss and review the steps in solving the problems, following completion of the activity.

Evaluation

STEP VII - Read through the evaluation exercise with the students and clarify any points which may be in question.

STEP VIII - Have the students work individually on the evaluation exercise. Following completion of the activity, discuss the correct answers with the class.

STEP IX - The Home and Community activity is optional, to be completed as time permits.

STUDENT ACTIVITY MATERIAL

RETAILING ALONG PROPORTIONAL LINES

On your last visit to a major department store, did you stop to think who put the merchandise there? Have you ever considered that you may be the man or woman responsible for all the goods available in a department store?

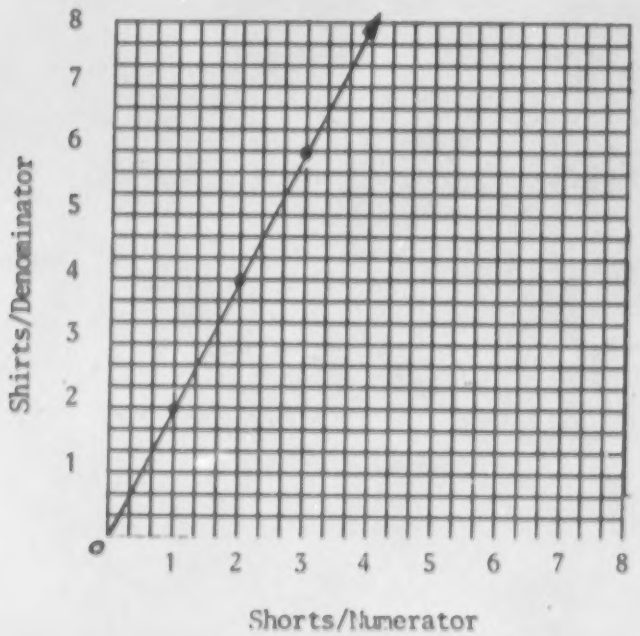
In the world of marketing and distribution, the success of department stores is to a great degree dependent upon the skills of the merchandising manager. At Mario's Department Store, for example, merchandising managers coordinate the distribution of goods, determine policies of sales, establish the percentages of mark-up for products, and determine the quantity of merchandise to be stocked and sold.

Through individual appointments with sales representatives and through trade shows held in New York, Atlanta, and Chicago, the merchandising managers study products which are in demand. They analyze the needs of their individual departments and try to find manufacturers who can supply products within their price guidelines. For Mario's managers, buying the right merchandise in the right amounts is the main goal in making a profit.

WHAT IS THE KEY TO SUCCESS?

To be successful, merchandising managers must know the interests of their customers, be able to make decisions, and have good math skills. Because they are specialists in buying, they must be able to work with fractions and find equivalent expressions.

For example, in the active sportswear division of Mario's, merchandising managers order soccer outfits in different proportions. For every short, they buy two shirts of different styles and colors. When ordering in large quantities, they often chart these proportions to show the direction of their buying practices.



$$\left\{\frac{1}{2}, \frac{2}{4}, \frac{3}{6}, \frac{4}{8} \ldots\right\}$$

Like many other merchandisers, Mario's managers change their proportions when buying certain items. To maintain their ratios of tops to bottoms, they use the "product rule" as a guide.

$$\frac{2}{3} = \frac{N}{12}$$

Since $2 \times 12 = 24$

Then $3 \times N = 24$

So $N = 8$

And $\frac{2}{3} = \frac{8}{12}$

If you were a merchandising manager, could you solve similar problems using the "product rule?"

1. If the following ratio represents the number of skirts on order to the number of short-sleeved tops, what will "N" be if:

$$\frac{4}{5} = \frac{N}{15}$$

2. If three pairs of knee britches are ordered to every seven football jerseys, what will "N" be if:

$$\frac{3}{7} = \frac{12}{N}$$

3. If two warm-up outfits are purchased for every three gymnastics suits sold, what will "N" be if:

$$\frac{2}{3} = \frac{N}{36}$$

4. If ten out of every forty manufacturers are suppliers for your stores, what will the ratio be if:

$$\frac{N}{4} = \frac{10}{40}$$

ANSWER KEY

1. n = 12 (skirts)
2. n = 28 (football jerseys)
3. n = 24 (warm-ups)
4. n = 1 (supplier)

During a visit to a retail establishment in their own communities, the students should:

a. Interview sales personnel and merchandising managers, if possible, to learn how they use fractions in marketing,

b. Observe how the merchandise is distributed, and

c. Try to write simple proportions, showing the ratio of certain items to other commodities carried by the store.

EVALUATION

Answer the following questions:

1. The success of department stores is to a small degree dependent upon the skills of its merchandising managers. True or False:

   _____

2. As buying specialists, merchandising managers must be able to coordinate the distribution of goods, establish policies of sales, and determine the quantity of merchandise to be stocked and sold. True or False:

   _____

3. When buying merchandise for their stores, merchandising managers frequently use the "product rule" to determine different proportions of goods? True or False: _____

4. As a merchandising manager, you have been asked to demonstrate your buying practices for shorts and shirts. If you buy two pairs of shorts for every three shirts, what will this ratio be if your purchases increase in the following proportions:

$$\frac{2}{3} = \frac{N}{6} = \frac{N}{12} = \frac{16}{N} = \frac{32}{N}$$

5. If you purchase four pleated skirts for every five cap sleeved tops, what will "N" be if:

$$\frac{4}{5} = \frac{24}{N}$$

EVALUATION

6. If you order five exercise suits for every six warm-up suits, how many times will you have increased your distribution, if your final ratio is $\frac{40}{48}$?_____

EVALUATION

Answer Key

1. False
2. True
3. True
4. $\frac{2}{3} = \frac{4}{6} = \frac{8}{12} = \frac{16}{24} = \frac{32}{48}$
5. n = 30
6. 8

Component 3

Section One

Section Two

Section Three

RIGHT ANSWERS MEAN GOOD BUSINESS

Introduction

In this component, jobs in the Business and Office Cluster are used to highlight problems involving decimals, fractions, and percentages. In the first section, the students will learn that business executives often consider the consumer's buying preferences when they make business decisions. The students will then discover what some of their own preferences are. In the second section, students will practice the life skills of figuring sales tax and discount rates and of handling a checkbook. The students will learn that the tax clerk and the department store manager also need to be able to do these math problems. The purpose of the third section is to give students additional practice in converting percentages to decimals and fractions.

GOALS

MOTIVATION: The students will use fractions and percentages to construct and interpret bar graphs, circle graphs, and line-segment graphs.

LIFE SKILLS: The students will use sales tax rates and discount rates to compute cost, change, and sales tax; they will also practice writing checks.

MATH SKILLS: The students will convert percentages to fractions or decimals in order to solve related problems.

LEARNING SECTIONS

Section 1: What Are Your Favorites?

Section 2: Let's Go Shopping

Section 3: Insurance--Protection for Your Life, Home, and Car

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COMPONENT III
Section One

Section One
What Are Your Favorites?

Learning Objective

Given data on business decisions and consumer preferences, the students will construct and interpret bar graphs, circle graphs, and line-segment graphs to show class preferences, completing the activity according to the criteria of the teacher.

Key Words

- circle graph
- bar graph
- line-segment graph
- double bar graph
- horizontal axis
- vertical axis
- business executive

Domains and Levels

Cognitive: Knowledge, Application, Synthesis

Affective: Receiving, Organization

Materials

- copies of the narrative for each student.
- extra preference charts
- graph paper

IMPLEMENTATION GUIDELINES

Time: *45 Minutes*

STEP I - Introduce the component with a question such as "How many pairs of jeans do you have?" or "What kind of jeans are your favorites?"

STEP II - State the purpose of the activity:
To learn that business decisions are often made on the basis of what people like, and that people's choices can be shown graphically.

STEP III - Read and discuss the student activity materials on jeans.
a. Note that the business executive's job falls in the area of management.
b. Name each kind of graph as it is discussed.
c. Ask students to read and interpret data from each graph.

STEP IV - Read and discuss the directions for "What Are Your Favorites?"

STEP V - Complete one of the charts on class favorites. Either the class or the teacher may decide which topic (music, food, etc.) to do first. If there is a choice not included which students feel is important, it may be added. (For example, a local food favorite can be added to the food choices.)

STEP VI - Each student will graph the information from the chart. The teacher, or students, may decide whether to use the circle or bar graph.

STEP VII - The activity can be repeated with other preference charts. Students may use the empty chart with a topic of their own choice.

Evaluation

STEP VIII - The evaluation is to be completed by students working individually.

STEP IX - The Home & Community activity will be assigned if time permits.

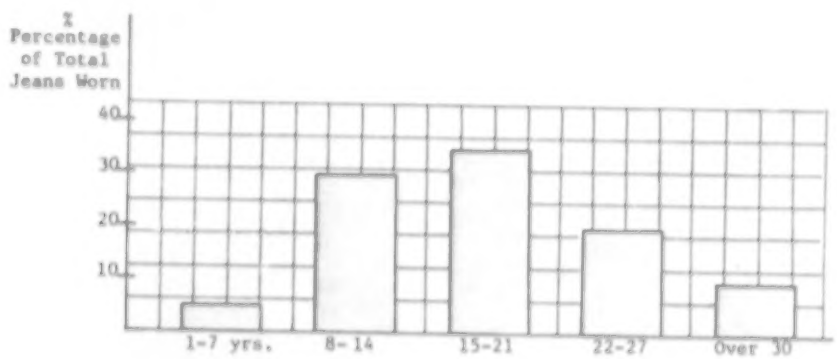
STUDENT ACTIVITY MATERIAL

Blue Jeans

Blue jeans--just about everybody likes blue jeans! Jeans come in all sizes, colors, and styles. They are worn by little kids and grandmas. Did you ever wonder how the blue jeans companies know how many baby-sized jeans and how many grandma-sized jeans to make?

Ms. Howard is a business executive with the Fine-Fit Jeans Company. As an executive, she must decide how many jeans should be made in the coming year. She bases her decisions on sales information from the past year. Much of this information can be shown on graphs.

This bar graph shows Ms. Howard what age group of people wear the most Fine-Fit jeans.



Age Groups

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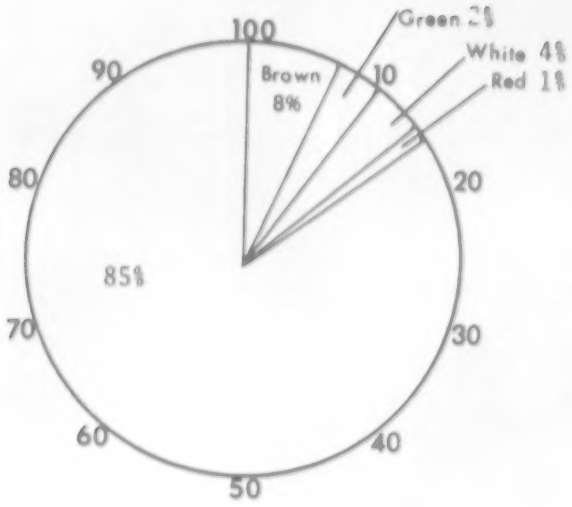
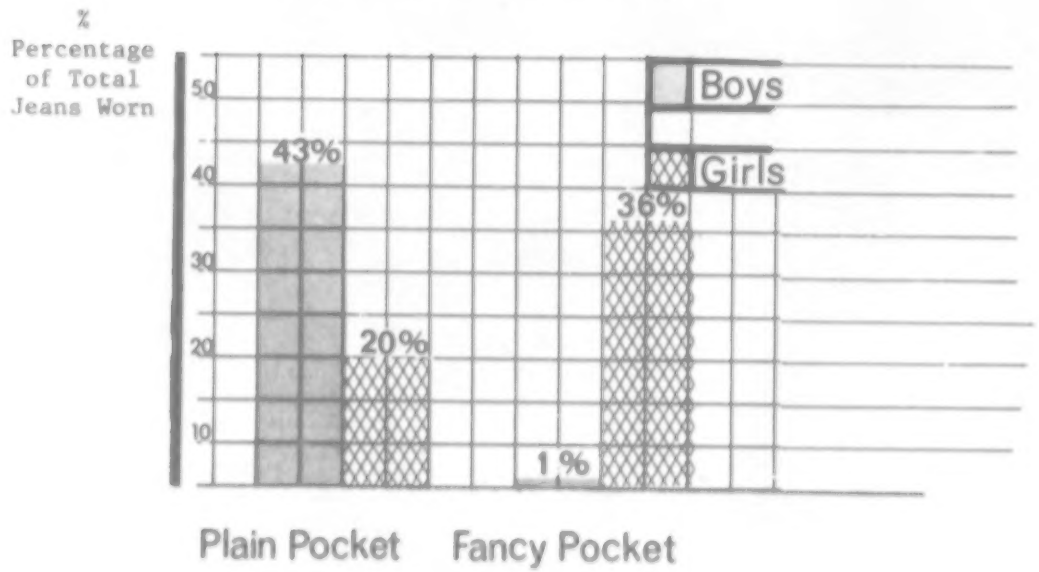
Ms. Howard knows that teenages especially like Fine-Fit jeans. She also needs to know what colors and styles they like best. These graphs will help her.

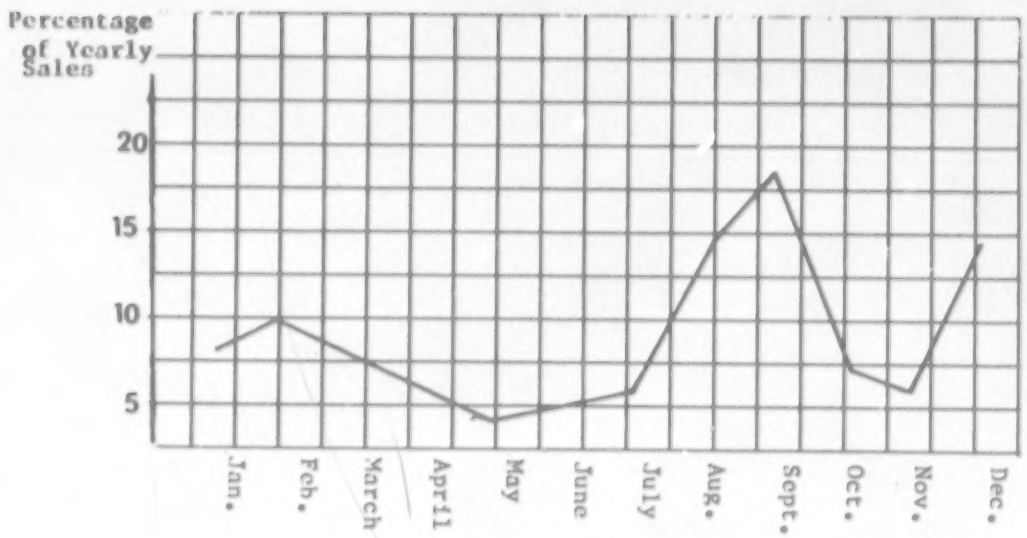


TEENAGE CHOICES OF JEANS COLORS



TEENAGE CHOICES OF POCKETS

Finally, Ms. Howard might need to know when the most Fine-Fit jeans are sold. This line-segment graph shows that information.



PERCENTAGE OF TOTAL SALES BY MONTH

What Are Your Favorites?

Business executives who work for various kinds of companies need to know what young people like. Let's find out what the kids in your class like. You will fill in a chart with your choices. You will then use the information on the chart to graph your class choices.

Here is what you need to do:

1. First, count the number of people in your class.
2. Now, vote on the choices listed on the chart you are using. Each person will vote only once. Record the number of votes on the chart.
3. Now, find out what fraction of the total votes each choice got. The numerator will equal the number of votes for that choice. The denominator will equal the number of people in your class. (Example: If there are 50 people in your class and 30 vote for rock music, the fraction will be 30/50.)
4. Convert each fraction to a percentage.
5. Make a bar or circle graph of your class' favorites, in the following page, using these percentages.

PREFERENCE CHARTS

Choice	Number of Votes	Fraction	Percent
Rock			
Country-Western			
Jazz			
Folk			
Classical			

* *

Food Favorites

Choice	Number of Votes	Fraction	Percent
Hamburgers			
Fried Chicken			
Tacos			
Pizza			
Corny Dogs			

PREFERENCE CHARTS

Choice	Number of Votes	Fraction	Percent
Rock			
Country-Western			
Jazz			
Folk			
Classical			

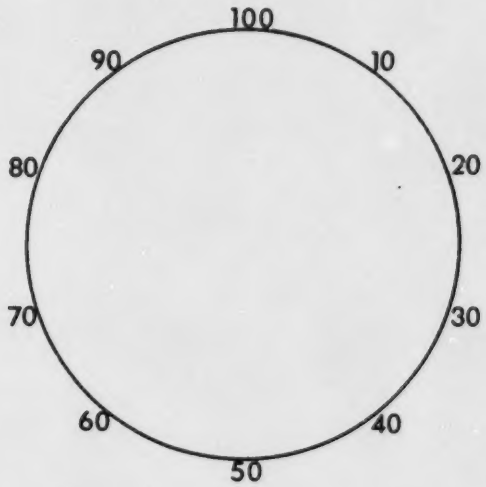
Food Favorites

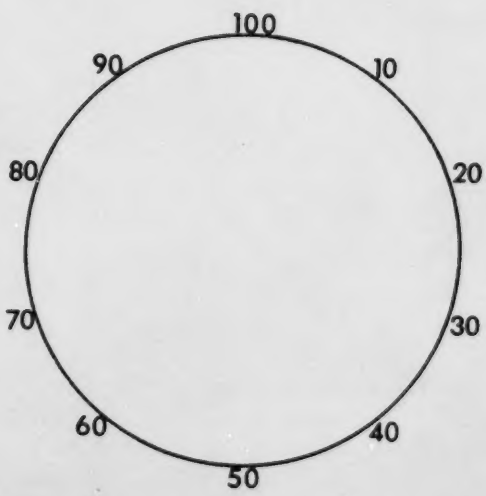
Choice	Number of Votes	Fraction	Percent
Hamburgers			
Fried Chicken			
Tacos			
Pizza			
Corny Dogs			

Food Favorites

BAR GRAPHS

CIRCLE GRAPHS



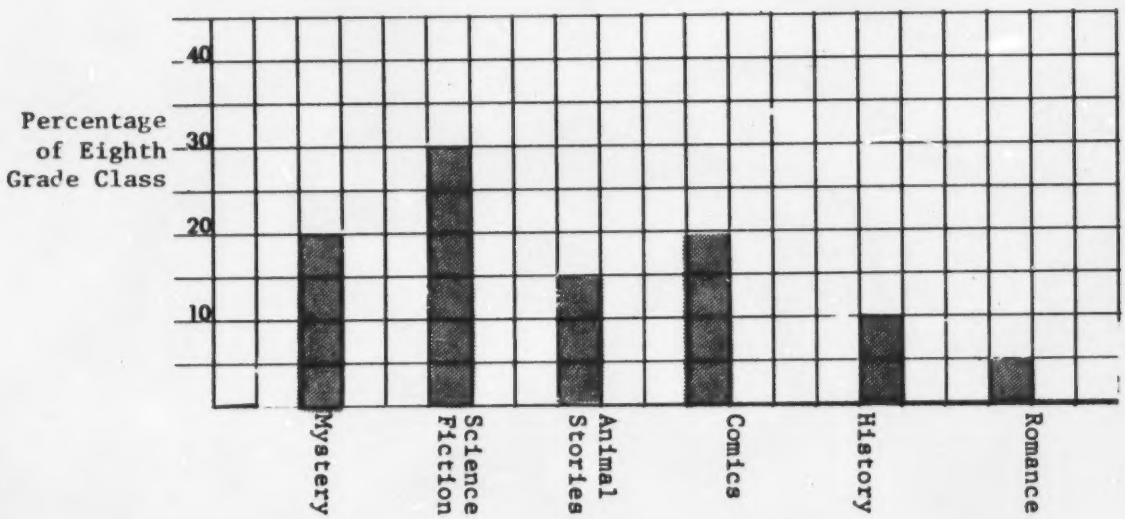


HOME and COMMUNITY

Each student will poll at least ten friends or relatives on a topic of the student's own choosing. The student will ask each person to choose a favorite from a list of at least three choices. The student will then prepare a bar or circle graph showing the results of the poll.

EVALUATION

Use this graph to answer the questions.



Eighth Grade Reading Favorites

1. What kind of graph is shown?

   _____

2. What percentage of the eighth grade likes to read comics best of all?

   _____

3. There are 100 people in the eighth grade class. How many chose animal stories as their favorite kind of book to read?

   _____

EVALUATION

ANSWER KEY

1. bar graph
2. 20%
3. 15%

COMPONENT III
Section Two

Section Two
Let's Go Shopping

Key Words

- sales tax
- discount
- percentage
- tax clerk
- manager
- department store

Learning Objective

Given the rate of sales tax, or the rate of discount, the students will perform basic operations in math to determine the total cost of sample purchases with 80% accuracy.

Materials

- one copy of the narrative for each student
- one set of answer sheets for each student (checks and check register).

Domains and Levels

Cognitive: Knowledge, Application

Affective: Receiving, Responding

IMPLEMENTATION GUIDELINES

Time: *45 Minutes*

Note: The ability to add, subtract, multiply, divide, and compute simple percentages, in order to figure out sales tax, discount rates, and change, and in order to handle a checkbook, are life skills which students will need in their everyday lives.

Group Activity

STEP I - Read and discuss the Introduction of the narrative.

STEP II - State the purpose of this activity:
To use percentages in computing sales tax and discount prices.

STEP III- Read the directions to Shopping at X's.

a. If necessary, review the methods for finding percentages.
Example: What is 5% of 240?

Use proportions: 5/100 = n/240
Change to decimal: .05 x 240
Change to fraction: 1/20 x 240

b. Discuss the answer sheet. Demonstrate how to write a check, if necessary. (If desired, the checks can be cut apart and stapled together to form a "checkbook".

Group or Individual Activity

STEP IV- Solve the problems in Shopping at X's.

a. The class may work all the problems together; or

b. The class may work the first problem together so everyone knows how to use the answer sheet. The remaining problems may then be done individually; or

c. All problems may be done individually.

Students should round off numbers to two decimal places.

Evaluation

STEP V - The evaluation is to be completed by students working on their own.

STEP VI - The Home and Community activity may be done if time permits.

STUDENT ACTIVITY MATERIAL

Introduction

Do you like to go shopping? Do you have a favorite shoe store, clothing store, or record shop? Many people like to shop in a department store because they can buy different kinds of things-- shoes, clothes, and records-- all in one store.

You may be surprised to learn that the first department store began in Paris, France, around the year 1865.* Before that time, people had to go to different stores for different things. Today there are many popular department stores in the United States.

When you go to a department store, the workers you usually see are busy selling things. They are only some of the workers the store needs. More than half the workers in a department store have business and office jobs which do not involve selling to customers.

One such job is done by the tax clerk. The tax clerk must figure out the state and federal tax which the store owes on the items sold. Another job is that of department manager. The manager may decide when there will be a sale and how much the discount will be. Both of these workers need to be able to work skillfully with percentages.

The department store workers are not the only ones who need to figure sales tax and discount rates. Someone else who needs to understand how to figure out taxes and discounts is you -- the shopper!

* Encyclopedia International, Vol. 5, Grolier Incorporated, 1966.

Shopping at X's

Let's take a trip to X's Department Store. The following problems will help you decide what to buy. Be sure to fill in the correct answers for each part of the problem. Then, when you have decided how much you will spend in each problem, write a check for this amount to X's Depart-Store. (You will see in your check register that you have a beginning balance of $100.00)

1. You go first to the stationery department. You choose these items:

Notebook	$2.95
Pen	4.85
Paper clips	.60

a. How much will these three items cost?

b. If the sales tax is 5%, how much tax do you owe for these three items?

c. Write a check for the total cost of the items and tax.

2. Now you are looking for a new shirt. You see several shirts on sale. There are two you like. A $15.00 shirt is on sale for 20% off. A $16.00 shirt is on sale for 25% off.

   a. What is the sale price of the first shirt?

   b. What is the sale price of the second shirt?

   c. Write a check for whichever shirt you want to buy.

3. You have earned $48.00 from your job. You want to spend only one-fifth of this amount on a new scarf.

   a. How much money can you spend?

   One scarf costs $9.00. Another scarf costs $9.40. The sales tax is 5%.

   b. How much tax will you owe for the $9.00 scarf?

   c. How much tax will you owe for the $9.40 scarf?

   d. Write a check for the total cost (cost plus tax) of the scarf you will be able to buy.

4. You are going to buy a pair of shoes. You see that some shoes are on sale.

   A $25.00 pair is on sale for 1/3 off.

   A $24.00 pair is on sale for 1/4 off.

   a. What is the sale price of the first pair?

   b. What is the sale price of the second pair?

   c. You decide to buy the pair which will cost the most. Write a check for this amount.

5. You have decided to buy a tape recorder. The tape costs $6.99. The sales tax is 5%.

   a. What is the total cost of the tape?

   b. You want to have some change in your wallet. Write a check for $20.00.

   c. How much change should the clerk give you?

6. You have written five checks. Make sure you record them on your check register. Subtract each check amount from the balance.

   a. What is your checkbook balance after your shopping trip?

   b. How much money did you spend? (Don't forget that you got change in problem five. Subtract this amount from the total of checks written)

ANSWER SHEET

Please deduct any service charges that may apply to your account

CHECK NO.	Date	CHECKS ISSUED	AMOUNT of CHECK		√ T	Check Fee	AMOUNT of DEPOSIT		BALANCE	

97

01

_____ 19__

PAY TO THE ORDER OF _____ $ _____

_____ DOLLARS

The Best Bank

MEMO _____ _____

211--5200:1 102179181: 01

02

_____ 19__

PAY TO THE ORDER OF _____ $ _____

_____ DOLLARS

The Best Bank

MEMO _____ _____

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03

_____ 19__

PAY TO THE ORDER OF _____ $ _____

_____ DOLLARS

The Best Bank

MEMO _____ _____

211--5200:1 102179181: 03

125

04

_____ 19___

PAY TO THE ORDER OF _____ $ _____

_____ DOLLARS

MEMO _____ _____

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05

_____ 19___

PAY TO THE ORDER OF _____ $ _____

_____ DOLLARS

MEMO _____ _____

211--5200:1 102179181: 05

Shopping at X's Answer Key

1. a. $8.40
   b. .42
   c. 8.82
2. a. $12.00
   b. 12.00
   c. 12.00
3. a. $9.60
   b. .45
   c. .47
   d. 9.45
4. a. $16.67
   b. 18.00
   c. 18.00
5. a. $ 7.34
   b. $20.00
   c. $12.66
6. a. $31.73
   b. $55.61

The students will find in the newspaper a department or discount store advertisement which lists items for sale. Using the local sales tax, they will figure out the total cost for each of five items.

The students will then choose one item and figure out how much it would cost with discount rates of 20%, 25%, 33⅓%, and 50% off the regular price.

EVALUATION

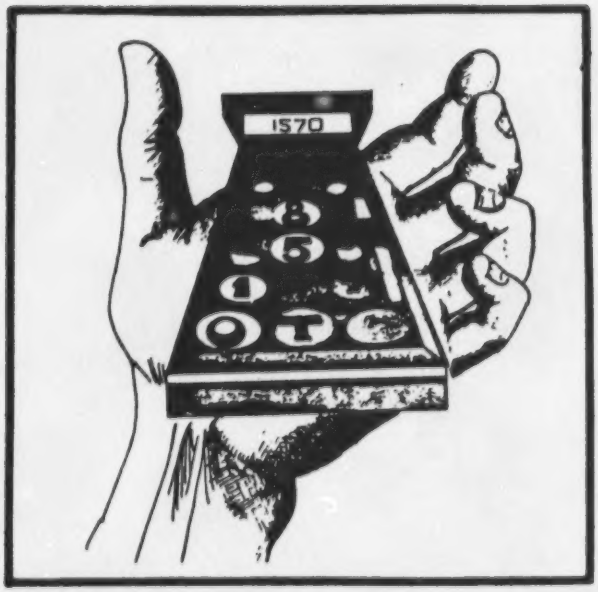
1. What is the total cost of a $369.00 sofa, with a sales tax rate of 6%?

2. The regular price of a hat is $10.98. It is on sale with a discount rate of 50%. What is the sale price?

EVALUATION

Answer Key

1. $391.14
2. $5.49



COMPONENT III

Section Three

Section Three

Insurance--Protection for Your Life, Home and Car

Key Words

- fraction
- decimal
- percent
- insurance
- insurance premium
- deductible

Learning Objective

Given a description of several types of insurance coverage, the students will convert percentages to decimals or fractions in order to solve related problems, with 80% accuracy.

Materials

- one copy of the narrative for each student.

Domains and Levels

Cognitive: Knowledge, Application

Affective: Receiving, Responding

IMPLEMENTATION GUIDELINES

Time: *45 Minutes*

STEP I- State the purpose of the activity:
To learn how people with business and office jobs in the field of insurance use fractions, decimals, and percentages.

STEP II- Read and discuss the Introduction. Make sure students understand what insurance is.

STEP III- If necessary, review the process of converting fractions, decimals, and percentages to any of the other two.

Example: 23% = 23/100 = .23
.48 = 48/100 = 48%
3/5 = 3 ÷ 5 = .60 = 60%

STEP IV- The students will solve the problems.

a. The class may read and discuss as a group the narrative part of each problem so that they understand the various concepts related to insurance. Students can then work the actual problems individually; or

b. All the problems can be read and solved individually; or

c. The class can work all the problems as a group.

Students should round numbers off to two decimal places.

Evaluation

STEP V- The evaluation is to be completed by students working individually.

STEP VI- The Home and Community activity is optional and will be done time permitting.

STUDENT ACTIVITY MATERIAL

Introduction

There are many different business and office jobs for people in the field of insurance. The insurance salesperson tell clients how much and what kinds of insurance are needed before he or she sells the insurance. The insurance claims adjuster investigates the situation when someone has had a loss, damage to property, or medical expenses. Then the adjuster determines how much the insurance company will pay. The insurance safety person inspects insured property to see if it is safe. The insurance clerk then checks on people who want to borrow money from the insurance company.

Each of these workers, as well as other insurance workers, needs to be able to solve math problems accurately. Insurance workers need to be particularly skillful in working with percentages, decimals, and fractions. Insurance companies often pay just a percentage of a loss, and the insurance workers must be careful in their calculations.

The following problems will show you how percentages may be used in the field of insurance. Even if you never have a job in insurance, you will probably buy insurance some day, so, insurance salesperson or insurance buyer--either way, you need to use percentages, fractions, and decimals!

Hospitalization and Medical Insurance

Many people have medical insurance which pays for part, but not all, of their medical expenses.

1. Mrs. Jones has insurance which pays 80% of her medical expenses. When she was ill, she received these bills.

Prescription Drugs	$ 42.00
Dr. W.F. Hartman	150.00
Medway Laboratories	65.00
	$257.00

a. How much money will the insurance company pay for these bills?

b. How much money will Mrs. Jones pay?

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2. Mr. García is trying to decide between two hospitalization plans. The first plan will pay only 80% of the bill if Mr. Garcia, or a member of his family, stays in the hospital. This plan costs $900. for one year. The second plan will pay all of Mr. García's hospital bills. But, this plan costs 3/5 more than the first plan.

   How much will the second plan cost Mr. García for one year of insurance?

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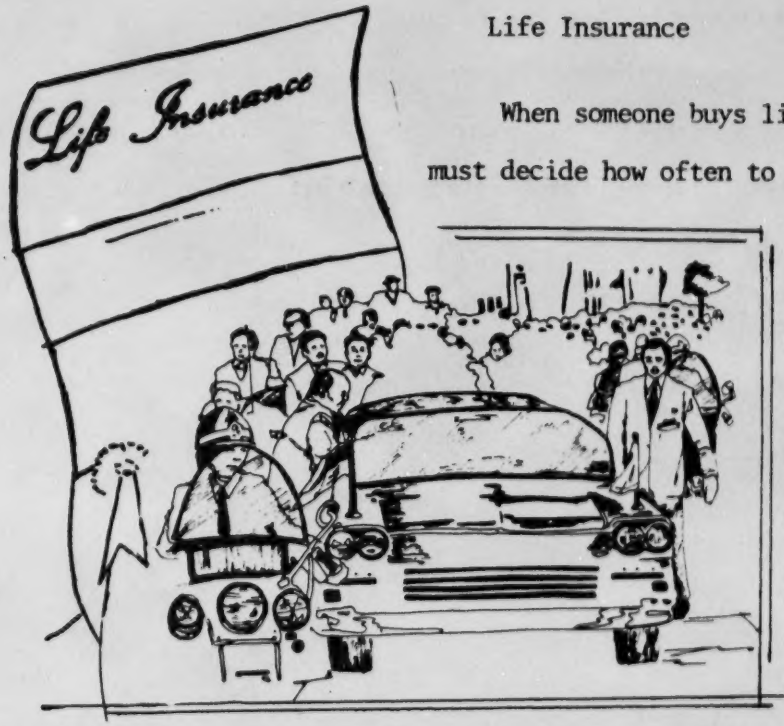
Life Insurance



When someone buys life insurance, he or she must decide how often to pay for the insurance. The insured person can pay the insurance premium just once a year, twice a year, quarterly, or every month. Paying more often than once a year is usually more expensive than paying it all at once.

3. Miss Cho's life insurance costs $168.70 a year if she pays the total amount all at once.

   If she decides to make two payments a year, each payment equals 52% of the yearly cost.

   a. What is 52% of $168.70?

   b. How much will these four payments total?

4. If Miss Cho decides to make four payments a year, each payment equals 26.5% of the yearly cost.

   a. What is 26.5% of $168.70?

   b. How much will these four payments total?

Home and Fire Insurance

When a person buys a house, he or she also buys insurance for the house. Then, if the house is damaged by fire, wind, or some other calamity, the insurance company will pay all or part of what it costs to fix the house. A person's belongings inside the house are also insured in case of damage or theft.

5. The Blakes have $65,000.00 worth of insurance on their house. The insurance company will also pay up to 50% of this amount for damage or theft of their belongings. What is the greatest amount the insurance company will pay for loss of the Blakes' belongings?

6. Last year the McClellans' had home insurance worth $55,000.00. This year their house is worth 8.8% more than it was worth last year. How much should their home insurance be worth this year?

Automobile Insurance

Automobile insurance pays for damage done to a car in a collision or by the weather. Most auto insurance is written with a deductible. A deductible is a set amount of money which the car owner must pay to fix the car. The insurance company will then pay the rest of the amount.

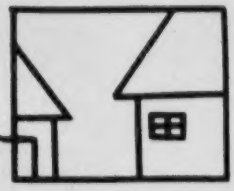
7. Mr. Eckberg has auto insurance with a $100.00 deductible. His car was damaged by a flood. It cost $500.00 to repair the car. Mr. Eckberg paid $100.00. The insurance company paid $400.00.

   a. What percentage of the total amount did Mr. Eckberg pay?

   b. What percentage of the total amount did the insurace company pay?

Answer Key

1. a. $205.60
   b. $51. 40
2. $1,440.00
3. a. $ 87.72
   b. $175.44
4. a. $ 44.70
   b. $178.80
5. $32,500.00
6. $59,840.00
7. a. 20%
   b. 80%



HOME and COMMUNITY

Students may discuss the following questions with members of their families.

1. What kinds of insurance do we have?
2. Do any of our insurance policies pay only a percentage of our loss or expenses?
3. Does our auto insurance have a deductible? How much is it?

EVALUATION

1. What is 44% of $254.00?

2. What is 2/5 of $6,478.00?

3. What percentage of $6,478.00 does 2/5 of $6,478.00 equal?

4. A man has an insurance policy which pays 80% of his medical bills. This man had these expenses.

Ambulance	$ 55.00
Emergency Room	125.00
X-Ray	75.00
Dr. Helen Bay	100.00

How much money will the insurance company pay of the man's total medical bill?

EVALUATION

Answer Key to Evaluation

1. $111.76
2. $2,591.20
3. 40%
4. $284.00